



Food chemistry and its quantification in Spanish dry-cured ham

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Abstract

Bioactive peptides derived from food matrices are currently a subject of intensive research, due to the multiple health benefits they can exert in the human body. However, the small size and low abundance of these peptides in complex matrices as well as the effect of food processing and gastrointestinal digestion on their structure, sequence, and functionality, are important challenges. Spanish dry-cured ham has been reported as a good and natural source of bioactive peptides mainly showing antihypertensive and antioxidant activities. In this work, the antioxidant peptide AEEEYPDL, identified from 9 months of curing dry-cured ham, showed good resistance to different heat treatments and salt contents. The bioactivity of the peptide significantly decreased after simulated gastrointestinal digestion. An optimised multiple reaction monitoring methodology was able to quantify the peptide AEEEYPDL at a concentration of 0.148 μg per g of dry-cured ham, despite the existing challenges in the quantification of bioactive peptides from complex matrices.

Keywords: food chemistry, Spanish, attitudes

The aim of this study was to compare the antioxidant capacities and phenolic compound profiles of wild and cultivated *Lupinus albus* L. seeds.

The total phenolic content (TPC), radical scavenging activity, ferric-reducing antioxidant power (FRAP) and antioxidant activity in an β -carotene-linoleic acid emulsion were determined. Liquid chromatography-mass spectrometry was used to identify phenolics. The TPC of lupin seeds ranged from 4.36 to 7.24 mg gallic acid equivalent/g dry matter (d.m.). The dominant phenolics of all genotypes were two p-coumaric acid derivatives (0.74–1.61 and 0.66–1.63 mg/g d.m.) and apigenin-6,8-di-C-glucoside (1.13–1.31 mg/g d.m.). The results of antioxidant assays of wild lupin extracts were similar to or lower than those of the cultivated variety. FRAP and ABTS+ scavenging activity were correlated with the contents of the more polar p-coumaric acid derivative and apigenin-6,8-di-C-glucoside. Generally, significant differences between cultivated and wild *L. albus* seeds were not found in antioxidant capacities and phenolic compound contents. It's beyond ironic that calls for translators to collaborate to produce higher quality – calls that are usually ignored – is what GT is actually doing. It is leveraging the work of all your colleagues on a massive global scale, and giving it away for free, as a bundled product.

GT has become the modern translation equivalent of the smartphone. Translators in the bulk market are still trying to sell digital cameras, and are frantically watching prices continue to

drop where “good enough quality” is sold. This is the same market where customers recognize that GT is often wrong, but it's instant, free and “good enough quality.” Now is GT perfect? Of course not. But neither is a smartphone. The lighting is often off, or people feel that they are not flattered, so they take several pictures and pick the one they like best. Snapchat and other platforms provide filters to make people look good, or thinner, or to adjust the color of their face or even to turn them into various cute creatures. All for free.

Shift in Expectations

People accept these imperfections in smartphones vs. what an exceptionally good high-end digital camera can produce – much as they accept translation imperfections with a shrug – because there has been a major shift in expectations.

Instant, free, convenient and “good enough” have changed what people expect. Which is why GT famously translates millions of more words every day than all human translators do in a year. Here's an intriguing question. As a translator with a smartphone, would you spend several hundred dollars to buy a digital camera to take the same pictures you do today with your smartphone?

I think we can safely say that the answer to that question is “no.”

Yet that is what translators in the bulk “good enough to understand” market are asking their clients to do every day. Pay them to translate texts that GT may actually produce better (remember that GT is often simply leveraging the existing translations of your very skilled colleagues).

Clients Awake to the New Reality

And now we are witnessing clients in the bulk market – agencies, small businesses, even major corporations – waking up to this reality. Clients who “just need to know what the document says” are beginning to push back even on the idea that a human needs to take the lead. They often question what a translator produces if they’ve seen a different translation on GT. They demand low, single-digit rates that almost require the use of GT, which turns translators into unwilling post-editors.

These clients’ view is reflected in a famous quote by the photographer Ken Rockwell: “The best camera you can use is the one you have on you.” Increasingly in the translation world, that is GT – and translators who have not honed their skills to move upmarket are feeling the undertow. And it’s getting worse, with rates continuing to edge downward, and translators feeling like commodities, where every human translator is considered indistinguishable from every other.

Markets Where Smartphones Fall Short.

To continue our analogy to smartphones, let’s recognize that there will always be markets where smartphones are simply not going to work as cameras. These are domains where quality really does matter and where the added expertise of the photographer is critical and well-compensated. For example:

Professional photo shoots of a wide range of products, from cars to food, for high-end professional use by companies;

Head-shots for professional portfolios;

Photojournalism where the impact of an image requires exceptional talent to capture;

Wedding and special-event photography;

Live-event coverage for media, sports, and entertainment for commercial purposes;

Studio settings for lighting, high-end equipment and the skills to use them.

Man between two round balancing boulders

In translation, those same markets also exist, but they lie several miles above the “good enough to understand” bulk market. These markets are referred to as the “value-added market” and the “premium market” (distinction discussed below) and typical products include:

Annual reports and formal financial disclosure statements required by law that are issued by multinational corporations, where translators must master regulatory issues and complex financial rules;

High-profile advertising by Fortune 500 companies, investment banks, high-end consumer goods companies, etc. in high-prestige venues;

Professionally published journals, articles and documentation in the sciences and engineering, requiring advanced technical training on the part of the translators;

Diplomatic and intelligence data in a wide array of fields critical to national security, both classified and unclassified, where translation often blends into analysis, requiring special expertise;

Translations adapted across cultures in ways where the two products end up as completely different works of art.

Computer-mediated communication (CMC) has recently made its way into the foreign language field as an innovative way to increase foreign language use in the classroom. While CMC suffers from a lack of extensive theoretical research, some studies have attempted to generate hypotheses for future research by exploring and identifying specific features of foreign language generated through the electronic medium (Warschauer, 1997). Others have successfully described particular cases of CMC use in the teaching and learning of foreign languages, thereby

shedding some light on the probable causes of those features (St. John & Cash, 1995; Wang, 1994). The present study seeks to observe whether these features, and/or additional ones, can also be identified in a group of first- and second-semester students learning Spanish as a foreign language in a mid-size, southern university. The observations resulting from this study are expected to expand the generalizations made in previous studies, and more finely tune theoretical propositions about how electronic communication can be integrated in the classroom to facilitate foreign language learning (Warschauer, 1997).

An additional goal of the present study is to predict some aspects of foreign language learner behavior resulting from the extension of students' roles as classroom learners into a wider perspective as world communicators. Using language both within and beyond the school setting is one of the five goals established by the recently developed Standards for Foreign Language Learning -- the "communities" goal¹.

According to the authors of this document, "Applying what has been learned in the language program as defined by the other standards, students come to realize the advantages inherent in being able to communicate in more than one language and develop an understanding of the power of language" (ACTFL, AATF, AATG, & AATSP, 1996, p. 60). Communicating in a foreign language through the In-

ternet will not only have a great motivational effect on the students (e.g., see Beauvois, 1995; Meunier, 1996; Warschauer, 1996), but may also ultimately improve the students' foreign language writing and speaking skills as they send and receive e-mail messages. By providing additional possibilities to receive input and produce output in the foreign language, communicating through the electronic medium can establish a rich context for language development to occur. According to Vygotsky's Zone of Proximal Development, language learners communicate by negotiating meaning, thereby creating an environment "to learn language, learn about language, and learn 'through' language" (Warschauer, 1997, p. 471). This idea is at the core of the sociocultural perspective of CMC, a conceptual framework suggested by Warschauer to encompass the purposes of students' language-related collaboration.

The text-based nature of the language produced through CMC offers additional advantages for language learning by making the written performance available for detained revision and, hence, further learning. This aspect of CMC has been identified by Warschauer (1997) as one of the characteristic features of CMC distinguishing it from other communication media. Other features of CMC include the possibility of long-distance exchanges, and that of using hypermedia links. In the world of the beginning foreign language classroom, however,

all these CMC features may not appear at the same level of language (and computer) proficiency. The kind of interaction analyzed in this study --instructor/student e-mail messaging-- may serve as a transition toward the use of foreign language in a real-cybernetic-world context.

The LINGUIST listserve2 recently included a discussion dealing with the subject "Lingua Franca for Electronic Communication." While some participants pointed out that global communication via the Internet offers an opportunity to learn and use other languages (Grimley-Evans, 1994), others argued that the Internet serves more to propagate the global dominance of English (Ao, 1995; Paolillo, 1995).

A mere look at the Spanish soc.culture newsgroups3 will show that there may be a sufficient amount of Spanish on the Internet for one, depending on his/her initial language proficiency level, to conceivably learn some Spanish through online interaction. Although the amount of English used on the Internet may be greater than other languages4, foreign language students who want to learn and use other languages may do so by simply connecting to the right links. Some transitional first steps are needed, however, and this is where foreign language teachers come into play. The initial opportunities to interact in the foreign language via electronic communication, as offered to students by their foreign language teachers, may provide the necessary first steps to

render learners capable of navigating the Internet autonomously in a foreign language.

In the present study, 50 students of first and second semester Spanish at the University of Southwestern Louisiana were offered the opportunity to increase their participation grade by communicating in Spanish with their instructor via e-mail, whenever and as often as they wanted, and about any topic of their choosing. By making participation voluntary, individual students selected themselves as the most representative of the phenomena under study, whose interaction would provide information-rich data. By focusing on individuals who manifested the desired behavior intensively, the identification of e-mail language features was facilitated, and the observations would prove more meaningful (Marshall & Rossman, 1995).

The subjects' participation was followed longitudinally over two semesters. Their global proficiency level at the beginning of the intervention was that of a typical beginning foreign language college student (equivalent to ACTFL Novice Low-Mid levels), and at the end of the second semester they had achieved levels equivalent to the ACTFL Intermediate Low level. Both the students' and the instructor's e-mail messages were systematically saved in a mailbox, which was consequently saved to a file for ease of retrieval. Messages were further organized by participant, chronologically ordered, and paired up with the corre-

sponding instructor's responses. A hard-copy printout of each set of instructor/student interaction facilitated the observation and analysis of language patterns.

The interaction was set in motion by the instructor sending a general message in Spanish to each one of the students around the second week of class, to which students responded individually. The initial message was kept short and simple, since they could only manipulate formulae or learned chunks of language (messages such as "Hello, how are you?" "I'm okay, thank you." "See you tomorrow in class" were typical at this stage). But as soon as new vocabulary and grammar were introduced into the regular class lessons, the messages soon became more personalized, dealing with family matters and class schedules, for example. Although all the students in the classroom were introduced and exposed to the new language, those choosing to participate in the e-mail dialogue journal activity had further opportunities to put into practice that language in a real communicative and meaningful way. As the students' messages became more elaborated, characteristics were noticed in their written performance in Spanish that were absent not only from the students' regular in-class writing assignments, but also from the characteristics observed in the written performance of students at similar proficiency levels, as observed, albeit impressionistically, in previous experiences with paper-and-pencil dialogue

journals. These observations are confirmed by Wang's (1994) comparison of dialogue journals written via e-mail with dialogue journals produced on paper. The writing excerpts offered herein are some unedited samples of the students' messages in which these characteristics could be observed⁵.

The written interaction described below is a CMC version of traditional dialogue journals. Dialogue journals were used initially in L1 (English freshman composition) and ESL classes, and later in foreign language classes, as a successful writing technique. The benefits of using dialogue journals in the classroom have already been reported elsewhere (Barba, 1993; Martínez-Lage, 1993; Peyton & Reed, 1990; Peyton, Staton, Richardson, & Wolfram, 1990): Students establish a written "dialogue" with the instructor about a topic of their choice, providing a very specific audience/reader and a purpose for communication which, according to the cognitive-process model of writing developed by Flower and Hayes (1981), are necessary components of the writing process. The instructor's responses act as models of accurate language, so grammatical corrective feedback is provided automatically. This covert form of correction has been shown to have a positive effect on L2 students' writing (Semke, 1984). Grammatical accuracy can then be overtly addressed in regular in-class writing activities, allowing the dialogue journals to be a freer activity.

Students benefit from the advantages of a safe writing environment to communicate their messages while maintaining a conversational format. It has been observed (Martínez-Lage, 1993; Peyton et al., 1990) that the language produced by L2 students in dialogue journals is as complex as, and sometimes more accurate than, that produced in teacher-assigned compositions. Furthermore, the use of dialogue journals in the foreign language classroom has been found to increase students' oral fluency (Barba, 1993). Thus, the use of dialogue journals holds potential for improving both writing and speaking skills in the foreign language.

Traditionally, dialogue journals are an in-class, paper-and-pencil activity. The electronic version of dialogue journals carries the same benefits mentioned earlier while incorporating the many advantages of CMC. Wang (1994) observed that using the electronic medium to conduct dialogue journals in her intermediate ESL class had additional advantages over paper-and-pencil dialogue journals. She observed that a group of ESL students using e-mail for their dialogue journals wrote more per writing session than did the paper-and-pencil group, asked more questions, used more language functions, and adopted a more conversational tone in their language. Some of these characteristics had been already observed in L1 CMC interactions (Ferrara, Bruner, & Whittemore, 1991; Maynor, 1994), and were also observed

in the Spanish language produced via e-mail by the subjects in the present study.

As far as the dialogue journal format is concerned, the following characteristics were identified in this study as being more beneficial in the electronic format than in the paper-and-pencil format.

Enhanced Quality of Participation

The dialogue journal activity does not necessarily have to involve exchanges between all the students in the classroom. Instead, participation can be voluntary. By making it a voluntary activity, the exchange becomes a spontaneous one. Baron (1984) points out that one of the most salient social effects of computer-mediated communication is a heightened degree of participation over face-to-face communication. She also notices that some computer users may feel more comfortable and volunteer more complete and accurate information than when interacting in face-to-face conversations. The implications that this bears in foreign language communication are obvious, and were particularly noticeable in the subjects of this study. The e-mail messaging gave some of the shy students, who would never initiate an open exchange, the opportunity to communicate in Spanish without having to face the embarrassment of making a mistake in front of the class. In fact, the level of creativity, confidentiality, and honesty exhibited in the messages generated by these types of student, when compared to those from

more outgoing and participative students, was surprising.

Because of the asynchronous nature and one-on-one format of e-mail, it is a modality that best suits the dialogue journal format. However, its characteristics are more appropriate to fit the situation of beginning foreign language learners since they are allowed to tailor the writing situation to their own pace and motivation. Instruction involving interaction between other students in the classroom may result in hindered participation (Berge, 1994), and in some cases, as mentioned by Warschauer (1997), may have negative effects on classroom interaction. Restricting the social interaction to the instructor, as in the case of dialogue journals, may encourage the shier students to participate. In addition, this limitation can result.

at least at the beginning level, in a greater exposure of learners to accurate input and corrective feedback from the instructor, which is unavailable in group interaction. In the electronic medium, these beneficial effects were enhanced as witnessed by the quantity and quality of the target language produced by the participants versus that observed during previous experiences with paper-and-pencil versions of dialogue journals.

Time/Space Management

With electronic dialogue journals, the writing activity usually takes place out of the classroom whenever the students can access a computer terminal. Students can also take their own

time writing messages. An important observation was that the students who had a terminal at home wrote longer and more elaborated messages than those who had to use the university terminals. This physical and psychological distancing from the school setting allowed for a greater variety of topics focused not necessarily on academic issues, but rather on topics of a more personal and mundane nature. Students who were forced to use the university terminals were probably more pressed for time or felt less comfortable sitting in a campus lab; consequently, they wrote less and about fewer topics, usually dealing almost exclusively with school matters. Interestingly, when the at-school students had the opportunity to use a friend's at-home terminal, they wrote longer messages similar to the ones written by their at-home peers.

Additional benefits of the electronic format over the paper-and-pencil format of dialogue journals is that instructors will not have to respond to 20-30 notebooks every time they collect the dialogue journals. Instead, they can answer the students' messages at their own pace, whenever they have time to log on. Furthermore, no class time is being consumed.

The capability of e-mail to be stored for later attention (Ferrara et al., 1991; Murray, 1988) becomes an obvious advantage to foreign language learners. Personal communications with the subjects revealed that many of them would save the instructor's messages

for when they had more time to re-read them and consult references before answering. Baron (1984) mentions some other advantages, such as reduced distractions and the opportunity to contemplate as well as reformulate and correct text. Murray (1988) reasons that "the terminal can provide an integrated work environment. . . because of the time delays and the lack of need to keep eye contact or provide back-channel cues" (p. 358). Some of the subjects reported the freedom to look up words and rules in dictionaries and textbooks in order to monitor their accuracy before sending messages. These opportunities were reduced in the paper-and-pencil version of dialogue journals due to time and situational constraints.

CMC for Second Language Learning Studies on the use of CMC with students learning a first language have pointed out numerous instances of CMC affecting the quality of the language produced, resulting in discourse somewhat different from both written and oral communication. It was therefore decided to investigate whether the characteristics observed in my L2 learners' written samples had any correlation with those observed in L1 CMC studies. If such a correlation was observed, it might be suggested that universal acquisition processes were at play since L2 processes could be said to parallel L1 ones. Therefore, the use of e-mail in the foreign language classroom may be proposed to enhance foreign language acquisition.

Some of the observations in L1 studies were compared to the data collected from the subjects in this study, and differences and similarities were found as described below. There were two general observations: (a) Students took advantage of the opportunities offered by the electronic medium to develop conversation-like language which they could not develop in regular in-class speaking activities for reasons of shyness and/or fear of making mistakes; and (b) they increased their target language output processes in ways that were more conducive to language acquisition than those offered by regular paper-and-pencil dialogue journals. The result was a language modality that shared both the spontaneity and freshness of spoken language and the accuracy and coherence of the written modality.

The features identified in this paper, together with the tentative explanations behind their cause in the particular setting of this study, are hoped to have contributed to a better understanding of the language learning process that results from the use of CMC in the context of a FL classroom. It is also hoped that further research in this topic confirms the suspicion that FL learners exposed to this learning tool may later become lifelong learners of the language beyond the classroom context. Bitterness and astringency are two important quality attributes of green tea infusion, and catechins are the main contributor to the bitterness and astringency. The aim of this work

was to quantitatively analyse the bitterness and astringency of green tea infusion according to the concentrations of catechins. The concentration-taste curves of catechins showed a pattern that fit the cubic functions, and their R^2 values were higher than 0.956. The bitterness of green tea was highly correlated with the concentrations of (-)-epigallocatechin gallate and (-)-epicatechin gallate (ECG) ($R^2 = 0.7769$, $p < 0.01$), and the astringency ($R^2 = 0.7878$, $p < 0.01$) was highly correlated with the concentrations of ECG and flavonol glycosides (myricetin 3-O-galactoside and quercetin-3-O-rutinoside). Taste interactions between different catechins and between catechins and other substances were determined. These results may enhance the understanding of tea chemistry for improving the taste of products from green tea.

This study investigates the enrichment of aptamers targeting the norovirus protruding domain in the presence of foods often associated with norovirus outbreaks. The goal is to explore if and how the presence of food alters in vitro selection of aptamers and target binding of the enriched oligonucleotides. Our study demonstrates that the introduction of food to SELEX (systematic evolution of ligands by exponential enrichment) is either detrimental to enrichment of oligonucleotides with target-specific binding, or facilitates enrichment of non-target-specific oligonucleotides. Moreover, a relationship between target binding of

enriched oligonucleotides in presence of food and their selection condition was not observed. Our findings also suggest that a pathogen specific aptamer with application in food does not need to be selected in presence of

the particular food, but may require properties beyond high affinity and selectivity to be applied for pathogen extraction and detection in undiluted food matrices.

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